

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant(s): Agee et al.

Group Art Unit: Unassigned

Serial No.: Cont. of 08/993,721

Examiner: Unassigned

Filed: August 3, 2001

For: HIGHLY BANDWIDTH EFFICIENT COMMUNICATIONS

**INFORMATION DISCLOSURE STATEMENT**

COMMISSIONER FOR PATENTS  
Washington, D.C. 20231

Sir:

Pursuant to Rule 56, applicant hereby calls the attention of the Patent Office to the references listed on the attached Form PTO 1449. Copy(ies) of these references ☐ are attached ☒ were filed in related application U.S. Serial No(s) 08/993,721, filed December 18, 1997, respectively.

- ☒ This document is being filed within three (3) months of the filing date of the application;
- ☐ Please charge the \$180 fee to Deposit Account No. , Order No. .
- ☒ This document is being concurrently filed with the above-identified application;
- ☐ This document is being concurrently filed with an Request for Continued Examination (RCE);
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- ☐ An Office Action has been issued and the appropriate Certification is enclosed. No fee is necessary;
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- ☒ The Commissioner is hereby authorized to charge any additional fees which may be required for this Information Disclosure Statement, or credit any overpayment to Deposit Account No. 13-4503, Order No. 4271-4036US3. A DUPLICATE COPY OF THIS SHEET IS ATTACHED.

Respectfully submitted,  
MORGAN & FINNEGAN, L.L.P.

Dated: Aug. 3, 2001

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<b>FORM PTO-1449</b>  <b>INFORMATION DISCLOSURE CITATION</b>				Attorney Docket: 4271-4036US3		Serial No.: Cont. of 08/993,721	
				Applicant: Agee et al.			
				Filing Date: 08/03/01		Group Art Unit: Unassigned	
<b>U.S. PATENT DOCUMENTS</b>							
Examiner Initial		Document Number	Date	Name	Class	Sub- Class	Filing Date
	AA	5,504,775	04/02/96	Chouly et al.			
	AB	5,896,425	04/1999	Hirano et al.			
	AC	5,923,700	07/1999	Zhang			
	AD	5,933,421	08/1999	Alamouti et al.			
	AE	5,999,569	12/1999	Oshima			
	AF	5,414,699	05/09/95	Lee			
	AG	5,490,174	02/06/96	Shin et al.			
	AH	5,278,892	01/11/94	Bolliger et al.			
	AI	3,745,464	07/10/73	Lee			
	AJ	4,827,499	05/02/89	Warty et al.			
	AK	5,305,308	04/19/94	English et al.			
<b>FOREIGN PATENT DOCUMENTS</b>							
		Document Number	Date	Country	Class	Sub- Class	Translation
	AL	WO 97/5709A	02/13/97	WIPO			<input type="checkbox"/> Yes <input type="checkbox"/> No
	AM	WO 96/22662A	07/25/96	WIPO			<input type="checkbox"/> Yes <input type="checkbox"/> No
	AN	WO 96/39001A	12/05/96	WIPO			<input type="checkbox"/> Yes <input type="checkbox"/> No
	AO	0 582 537A	02/09/94	EPO			<input type="checkbox"/> Yes <input type="checkbox"/> No
	AP	WO 96/31009A	10/03/96	WIPO			<input type="checkbox"/> Yes <input type="checkbox"/> No
<b>OTHER DOCUMENTS (Including Author, Title, Date, etc.)</b>							
	AR						
	AS						
	AT						
Examiner				Date Considered			
EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP §609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to Applicant.							

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 09/920903  
 08/03/01

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<b>U.S. PATENT DOCUMENTS</b>							
Examiner Initial		Document Number	Date	Name	Class	Sub- Class	Filing Date
	AA	5,084,869	01/28/92	Russell			
	AB	5,226,071	07/06/93	Bolliger et al.			
	AC	4,495,648	01/22/85	Giger			
	AD	5,136,612	08/04/92	Bi			
	AE	4,644,562	02/17/87	Kavehrad			
	AF	5,515,378	05/07/96	Roy III et al.			
	AG	4,488,445	12/18/84	Aske			
	AH	5,410,538	04/25/95	Roche et al.			
	AI	5,260,967	11/09/93	Schilling			
	AJ	5,291,475	03/01/94	Bruckert			
	AK	5,319,634	06/07/94	Bartholomew			
<b>FOREIGN PATENT DOCUMENTS</b>							
		Document Number	Date	Country	Class	Sub- Class	Translation
	AL	0 696 856A	02/14/96	EPO			<input type="checkbox"/> Yes <input type="checkbox"/> No
	AM	0 668 664A	08/23/95	EPO			<input type="checkbox"/> Yes <input type="checkbox"/> No
	AN	WO 94/05094A	03/03/94	WIPO			<input type="checkbox"/> Yes <input type="checkbox"/> No
	AO						<input type="checkbox"/> Yes <input type="checkbox"/> No
	AP						<input type="checkbox"/> Yes <input type="checkbox"/> No
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	AA	5,319,634	06/07/94	Bruckert			
	AB	4,383,332	05/10/83	Glance et al.			
	AC	5,260,968	11/09/93	Gardner et al.			
	AD	5,481,570	01/02/96	Winters			
	AE	5,933,478	08/03/99	Ozaki et al.			
	AF						
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	AH						
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	AK						
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	AM						
	AN						
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	AP						
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	1	Theodore S. Rappaport, "Multiple Access Techniques for Wireless Communications," WIRELESS COMMUNICATIONS: PRINCIPLES AND PRACTICE, 1996 Prentice Hall, Chapter 8, pp. 395-410.					
	2	Litva et al., "Fundamentals of Digital Beamforming", DIGITAL BEAMFORMING IN WIRELESS COMMUNICATIONS, 1996 Artech House, Inc., Chapter 2, pp. 13-57.					
	3	Ramjee Prasad, "CDMA System Concepts", CDMA FOR WIRELESS PERSONAL COMMUNICATIONS, 1996 Artech House, Inc., Chapter 3, pp. 39-61.					
	4	Swales et al., IEEE Trans. Veh. Technol. Vol. 39, No. 1, February 1990					
	5	Chang, <i>Bell Sys. Tech. Jour.</i> , Vol. 45, pp. 1775-1796, Dec. 1966					

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		Filing Date: 08/03/01	Group Art Unit: Unassigned
	6	Weinstein and Ebert, IEEE Trans. on Comm. Tech., Vol. com-19, No. 5, Oct. 1971, page 628.	
	7	"Multicarrier CDMA in indoor wireless radio networks," <i>Proc. PIMRC '93</i> , Yokohama, Japan, pp. 109-113, September 1993.	
	8	Davies et al., in A.T.R., Vol. 22, No. 1, 1988 .	
	9	Telecom Australia, Rev. Activities, 1985/1986, pp. 41-43.	
	10	"Wireless personal Communications: Trends and Challenges", Rappaport, Woerner and Reed, editors, Kluwer Academic Publishers, 1994, pp. 69-80.	
	11	Proc. Virginia Tech. Third Symposium on Wireless Personal Communications, June 1993, pp. 15-1 to 15-12.	
	12	Fazel, "Narrow-Band Interference Rejection in Orthogonal Multi-Carrier Spread Spectrum Communications", Record, 1994, Third Annual International Conference on Universal Personal Communications, IEEE, 1994, pp. 46-50.	
	13	N. Yee, Jean-Paul M.G. Linnarta, G. Fettweis, " <i>Multi-Carrier CDMA in Indoor Wireless Radio Networks</i> ", <i>IEICE Transactions on Communications</i> , Vol. E77-B, No. 7 pp. 900-904, July 1994.	
	14	L. Vandendorpe, " <u>Multitone Spread Spectrum Multiple Access Communications System in a Multipath Rician Fading Channel</u> ", <i>IEEE Transactions on Vehicular Technology</i> , Vol. 44 No.2, pp.327-337, May 1995.	
	15	L. Vandendorpe, " <u>Multitone Direct Sequence CDMA System in an Indoor Wireless Environment</u> ", <i>IEEE First Symposium on Communications and Vehicular Technology</i> , Benelux Delft Netherlands, pp.4.1-1 to 4.1-8, October 27-28- 1993.	
	16	K. Fazel, " <u>Performance of CDMA/OFDM for Mobile Communication System</u> ", <i>2nd IEEE International Conference on Universal Personal Communications</i> , Ottawa, Ontario, pp.975-979, October 12-15, 1993.	
	17	G. Tsoulos, et al. " <u>Adaptive Antennas for third generation DS-CDMA cellular systems</u> ", <i>Proc. IEEE VTC'95</i> , pp.45-49, Aug. 1995.	
	18	Y. Wang et al., " <u>Adaptive antenna arrays for cellular CDMA communication systems</u> ", <i>Proc. IEEE Intl. Conf. Acoustics, Speech and Signal Processing</i> , Detroit, pp. 1725-1728, 1995.	
	19	B. Quach, et al, " <u>Hopfield network approach to beamforming in spread spectrum communications</u> ", <i>IEEE Proc. Seventh SP Workshop on Statistical Signal and Array Processing</i> , pp. 409-412, June 1994.	

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	20	A. Sandhu, et al. " <u>A Hopfield neurobeamformer for spread spectrum communications</u> ", <i>Sixth IEEE Int. Symposium on Personal, Indoor and Mobile Radio Communications</i> , Sept. 1995	
	21	A. F. Naguib, et al. " <u>Performance of CDMA cellular networks with base-station antenna arrays</u> ", in C. G. Gunther, ed. " <i>Mobile Communications - Advanced systems and components</i> ", Springer-Verlag, pp. 87-100, March 1994.	
	22	V. Ghazi-Moghadam, et al, " <u>Interference cancellation using adaptive antennas</u> ", <i>Sixth IEEE Int. Symposium on Personal, Indoor and Mobile Radio Communications</i> , pages 936-939, Sept. 1995.	
	23	H. Iwai, et al. " <u>An investigation of space-path hybrid diversity scheme for base station reception in CDMA mobile radio</u> ", <i>IEEE J.Sel.Areas, Comm.</i> , vol.SAC-12, pp.962-969, June 1994.	
	24	R. Kohno, et al. " <u>A spatially and temporally optimal multi-user receiver using an array antenna for DS/CDMA</u> ", <i>Sixth IEEE Int. Symposium on Personal, Indoor and Mobile Radio Communications</i> , Toronto, pages 950-954, Sept. 1995.	

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